SIX MONTHLY COMPLIANCE REPORT ON

"SOLID WASTE MANAGEMENT CENTRE AT TUIRIAL, AIZAWL, MIZORAM"

For the Period of April 2024 - Sept 2024

Prepared By
ECOMS
&
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2024

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Chapter 1.

Introduction and Project Description

Introduction

This project has been granted environmental clearance letter no. MoEF Letter No.: F.No.10-73/2010-IA.III. dated the 9/01/13. by the Ministry of Environment and Forest.

Project Description

Salient Features:

The project is about the Municipal Solid Waste Management Facility at Tuirial, located approximately 20 km from Aizawl City. This processing facility is used to process all the municipal waste generated by Aizawl City. It includes the collection, segregation, composting, and landfilling of waste. It consists of a Mechanical Compost Plant with a capacity of 50 TPD, shed for Windrow Composting, a Waste Resource Center for processing dry waste, including baling machines and a shed for waste storage. It also includes a sanitary landfill, which remains unused to date.

Waste Water and Rainwater:

The leachate collection layer is provided in the granular soil (drainage layer or the bottom linear the system. The collection layer shall comprise of a network of perforated hope lateral pipes laid a slope of 2% and 20 m c/c spacing. These laterals collect leachate and transfer it to the HDPE header pipe, which is laid at a slope of 1%. The header pipe ultimately transfers the leachate into the Leachate collection sump. The general arrangement of header and laterals is provided in the layout plan of MSW landfill.

The landfill will receive municipal solid waste only. All operations are planned in such a way that generation of liquid waste is low and the leachate directly reaches the leachate collection sump for treatment. Apart from the leachate generated as a result of inflow of rainwater into the landfill, the seepage from the moisture content present in the solid waste and the moisture present in the daily soil cover are the few sources of leachate generation. 10 % evaporation has been considered.

Parking:

The site has adequate parking facilities.

Project Status

Project site is in post-constructional/ operational phase.

Purpose of the Report

This six-monthly report is being submitted as per the condition stipulated in the Environmental Clearance letter. Further, the study will envisage the environmental impacts that have generated in the local environment due to the project.

The environmental assessment is being carried out to verify: -

- That the project does not have any adverse environmental impacts in the project area and its surrounding.

- Compliance with the conditions stipulated in the Environmental Clearance Letter.

- That the Project Management is implementing the environmental mitigation measures as suggested in the approved Form-1, Form-1A, Environmental Management Plan (EMP) and building plans.

- The project proponent is implementing the environmental safeguards in true spirit.

- Any non-conformity in the project with respect to the environmental implication of the project.

Chapter 2.
Part- A General Conditions:

Sl.No	General Conditions	Compliance
1	Full support shall be extended to the officers of this ministry/Regional Office at Shillong by the project proponent during inspection of the project for monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities.	Complied
2	A six-Monthly monitoring report shall need to be submitted by the project proponents to the Regional Office of this Ministry at Shillong regarding the implementation of the stipulated conditions.	It has been submitted regularly.
3	Ministry of Environment & Forests or any other competent authority may stipulate any additional conditions or modify the existing ones, if necessary, in the interest of environment and the same shall be complied with.	No modifications were made.
4	The Ministry reserves the right to revoke this clearance if any of the conditions stipulated are not complied with to the satisfaction of the Ministry.	Noted
5	In the event of a change in project profile or a change in the implementation agency, a fresh reference shall be made to the Ministry of Environment and Forests.	Noted
6	The project proponents shall inform the Regional Office as well as the Ministry of the date of financial closure, final approval of the project by the concerned authorities, and the date of the start of land development work.	Complied
7	A copy of the clearance letter shall be marked to concern Panchayat/local NGO, if any, from whom any suggestion/representation has been made, received while processing the proposal.	It can be issued as per requirements.
8	State Pollution Control Board shall display a copy of the clearance letter at the Regional Office, District Industries Centre and Collector's Office/ Tehsildar's officefor30days.	Complied.
9	These stipulations would be enforced, among others, under the provisions of the Water (Prevention and Control of Pollution) Act, 1974	Noted

PART-B Specific Conditions:

Sl. no	SPECIFIC CONDITIONS	ACTION TAKEN	REMARKS
1	The "Consent to Establish" shall be obtained from the Board under Air and Water Act a copy shall be submitted to the Ministry before start of any construction work at the site.	"Consent to Establish" was granted by Mizoram Pollution Control Board, Aizawl, Mizoram vide letter No: **H88088/Poltn/9(154)2015-MPCB/151 dated 7th Sept. 2018.**	Document attached. Annexure X (Page No. 31)
2	Existing landfill site shall be closed scientifically.	Landfill improvement work is in progress.	The existing landfill will be closed scientifically as per the Environmental Clearance condition when it is not in operation after the project.
3	The proponent shall ensure that the project fulfills all the provisions of Solid Wastes (Management and Handling) Rules, 2000 including collection and transportation design, etc.	1. Waste collection is being done by PPP mode at point to point conducted by each local council in every locality. 2. Segregation is being done on the basis of wet and dry. Non segregated wastes are rejected and returned to the owners by the collectors. 3. A total of 151nos of vehicles ply around different 85 localities every day except on Sunday. The vehicles are being properly covered and some vehicles are being specially designed for garbage truck. 4. Composting of wet waste was being done at the Composting centre. 5. Recyclable waste are segregated	
4	The gas generated from Landfill facility shall be collected and disposed/utilized per rules.	Gas collection plan was already made. Due to technical issues, it was not implemented which will be implement as soon as the landfill meet requirements.	Landfill improvement work is still in progress.Landfill gas generated will be collected once the improvement work is finished.

5	The Leachates from the facility shall be collected and treated to meet the prescribed standards before disposal.	Maintenance and monitoring of leachate treatment tank were done in which the treatment facility and filter medial were re installed. Also, new leachate collection and treatment system for leachate from pre-storage area will be collected and treated.	Testing results of leachates is attached as "Effluent water testing results". The leachate quality were under the prescribe limit. (ANNEXURE I-A and V-A Page No. 12 and 21).
6	The depth of the Landfill site shall be decided based on the ground water table at the site.	The depth of ground water is around 20m from the ground.	Map indicating Ground Water Potential attached.Fig 1. Page No.10.
7	An on-site Emergency Management shall be prepared and implemented.	On-site Emergency Management Plan was prepared and implemented effectively.	Document already submitted on December 2022.
8	Periodic ground water/soil monitoring to check the contamination in and around the site shall be carried out.	Ground water/Soil monitoring has been done in and around the site.	Report attached for Water, Air, Noise and Soil monitoring in Annexure. Groundwater sample from bore well has been taken and analysed. (ANNEXURE I-F Page No.17 & V-F Page No.26)
9	Odour control measures shall be carried out.	Covering the landfill weekly with soil to reduce odour from newly deposited wastes will be carried out once the main Landfill is in full operation following the MSW Rules 2016.	Landfill improvement work is in progress.
10	Green Belt of at least 20% of total area shall be providing all around the unit.	Green Belt is maintained surrounding the SWMC, which covers around 40% approx. of the total area.	List of trees inside green belt and map showing green belt area is attached. (ANNEXURE XI page 32-33).

11	The Project proponent will set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.	Separate environmental cell is constituted.	List of members is attached in this report. (ANNEXURE IX Environmental Cell: page 30).

Chapter 3

Details of Environmental Monitoring

AMBIENT AIR QUALITY MONITORING

Ambient Air Quality Monitoring Stations

Ambient air quality monitoring has been carried out at Five locations during the period of April to Sept, 2024. This will enable to have an analytical understanding about air quality and the changes in the air environment in the study area with respect to the condition prevailing. The location of the ambient air quality monitoring station is given in Table.

Details of Ambient Air Quality Monitoring Stations

S. No.	Location Code	Location Name/Description	Environmental Setting
1.	**Air SWMCT 1**	**SWMC Tuirial project site**	Landfill site
2	**Air SWMCT 2**	**SWMC Tuirial 2km North from project site**	Residential
3	**Air SWMCT 3**	**SWMC Tuirial 2km South from project site**	Residential
4	**Air SWMCT 4**	**SWMC Tuirial 2km Northeast from project site**	Residential
5	**Air SWMCT 5**	**SWMC Tuirial 2kmSoutheast from project site**	Residential
6	**Air SWMCT 6**	**SWMC Tuirial 2kmWest from project site**	Residential

Ambient Air Quality Monitoring Methodology

Monitoring was conducted in respect of the following parameters:

- Particulate Matter 2.5 (PM 2.5)
- Particulate Matter 10 (PM 10)
- Sulphur Dioxide (SO_2)

- Oxides of Nitrogen (NO_2)
- Carbon Monoxide (CO)

The duration of sampling of PM2.5, PM10, SO2 and NOx was 8 hourly continuous sampling per day and CO was sampled for 1 hour continuous, thrice in 24 hour duration monitoring. The monitoring was conducted for one day at the location. This is to allow a comparison with the National Ambient Air Quality Standards.

The air samples were analyzed as per standard methods specified by Central Pollution Control Board (CPCB) and IS: 5182. The techniques used for ambient air quality monitoring and minimum detectable levels are given in the Table.

Fine Particulate Sampler (Greentech High Volume Air Sampler) instruments have been used for monitoring Particulate Matter 2.5 (PM2.5 i.e. <2.5 microns), and Respirable Dust Sample was used for sampling Respirable fraction (<10 microns), gaseous pollutants like SO2, and NOx. Bladder and Aspirator bags were used for collection Carbon monoxide samples. Gas Chromatography techniques have been used for the estimation of CO.

Table: Techniques used for Ambient Air Quality Monitoring

S. No.	Parameter	Technique	Technical Protocol
1	ParticulateMatter2.5	Fine Particulate Sampler (Greentech High Volume Air Sampler), Gravimetric Method	IS-5182 (Part-IV)
2	Particulate Matter10	Respirable Dust Sampler (Greentech High Volume Air Sampler) with cyclone separator, Gravimetric Method	IS-5182 (Part-23)
3	Sulphur dioxide	Modified West and Gaeke	IS-5182 (Part-II)
4	Nitrogen dioxide	Jacob & Hochheiser	IS-5182 (Part-VI)
5	Carbon Monoxide	Gas Chromatography	IS-5182 (Part-X)

AMBIENT NOISE MONITORING

Ambient Noise Monitoring Locations

The main objective of noise monitoring in the study area is to assess the present ambient noise levels in project site due to various construction allied activities and increased vehicular movement. A preliminary reconnaissance survey has been undertaken to identify the major noise generating sources in the area. Ambient noise monitoring was conducted at 1 location during the period of April and September, 2024 as given in below:

Details of Ambient Noise Monitoring Stations

S. No.	Location Code	Location Name/Description	Present Landuse
1.	**Noise SWMCT1**	**SWMC Tuirial project site**	Landfill Site
2	**Noise SWMCT 2**	**SWMC Tuirial 1km South from project site**	Residential
3	**Noise SWMCT 3**	**SWMC Tuirial 1 km North from project site**	Residential
4	**Noise SWMCT 4**	**SWMC Tuirial 1 km Northeast from project site**	Residential
5	**Noise SWMCT 5**	**SWMC Tuirial 1 km East from project site**	Residential
6	**Noise SWMCT 6**	**SWMC Tuirial 1 kmWest from project site**	Residential

Methodology of Noise Monitoring

Noise levels were measured using integrated sound level meter Noise meter HP-822A. The integrating sound level meter is an integrating/ logging type with Octave filter attachment with frequency range of 31.5 to 16000 Hz. This instrument is capable of measuring the Sound Pressure Level (SPL), Leq and octave band frequency analysis.

Noise level monitoring was carried out continuously for 2 hours. The noise levels were monitored on working days only. During each hour Leq were directly computed by the instrument based on the sound pressure levels.

GROUNDWATER AND SURFACE WATER QUALITY MONITORING

Groundwater Quality Monitoring Locations

Groundwater table were below 2 meters depth. Groundwater was taken from two sites

1. Tuirial

2. Borewell adjacent to landfill site

Surface Water and Waste Water:

Surface Water samples were collected from five location and waste water from two Location sites. Sample collection and analysis were done with the standard given by IS 3025-3 (1987): Methods of Sampling and Test (Physical and Chemical) for Water and Wastewater. The samples were analyzed for various parameters to compare with the standards for drinking water as per IS: 10500 for Surface water sources. The details of water sampling locations are given in Table.

Details of Water Quality Monitoring Station

S. No.	Location Code	Location Name/Description
1.	**Water SWMCT 1**	**on site Tuirial SWMC Leachate**
2.	**Water SWMCT 2**	**on site Tuirial SWMC Leachate**
3	**Water SWMCT 3**	**Tuirial River**
4	**Water SWMCT 4**	**Luite, perennial stream**
5	**Water SWMCT 5**	**Tuikhur at Tuirial village**
6	**Water SWMCT 6**	**Muthi River**
7	**Water SWMCT 7**	**Borewell on siteTuirial SWMC**

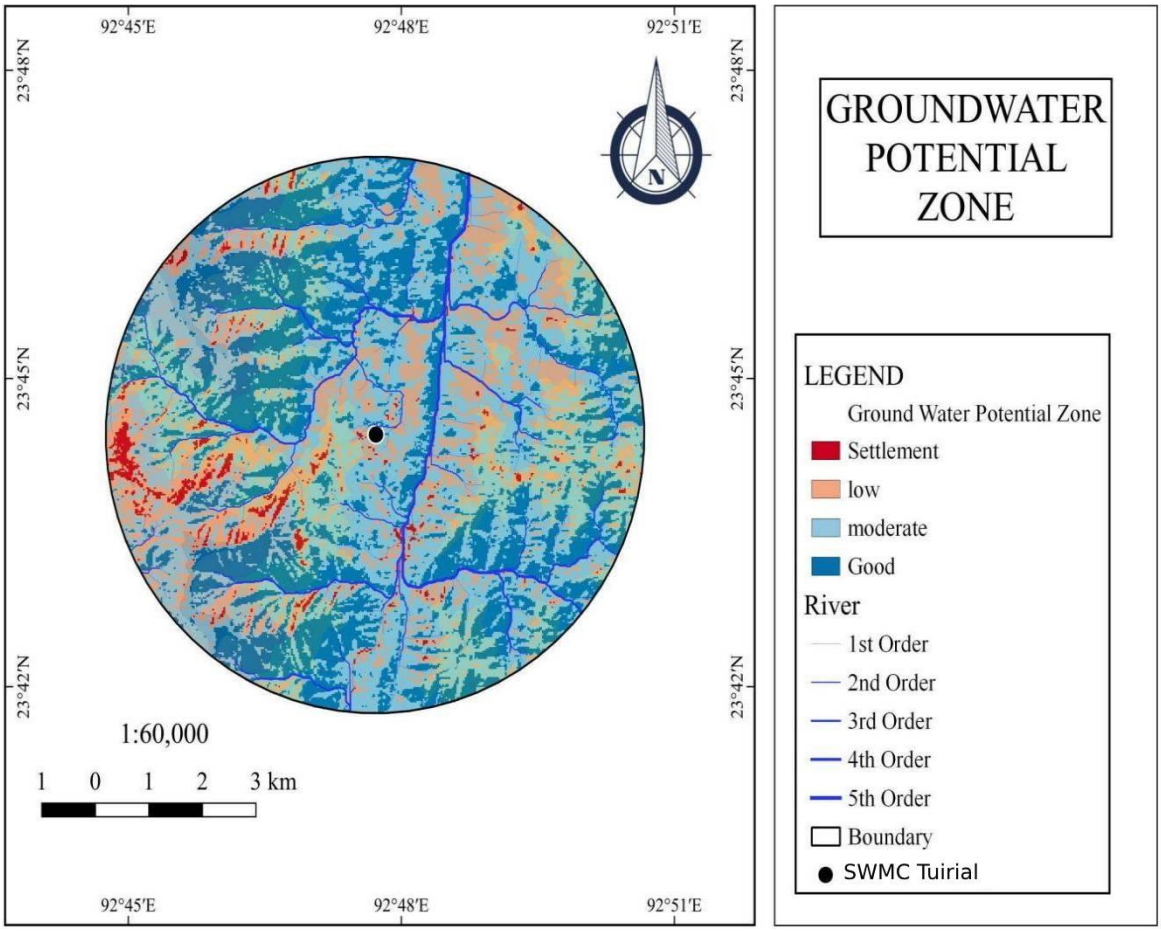

Fig1: Ground Water Potential Zone.

SOIL MONITORING

Soil Monitoring Locations

The objective of the soil monitoring is to identify the impacts of ongoing project activities on soil quality and also predict impacts, which have arisen due to execution of various constructions allied activities. Accordingly, a study of assessment of the soil quality has been carried out.

To assess impacts of ongoing project activities on the soil in the area, the physico-chemical characteristics of soils were examined by obtaining soil samples from selected points and analysis of the same. One sample of soil was collected from the project site for studying soil characteristics, the location of which is listed in Table.

Details of Soil Quality Monitoring Location

S. No.	Location Code	Location Name/Description
1.	**Soil SWMCT 1**	**SWMC Tuirial L1(Top Left)**
2.	**Soil SWMCT 2**	**SWMC Tuirial L2 (Center)**
3.	**Soil SWMCT 3**	**SWMC Tuirial L3(Top Right)**

4.	**Soil SWMCT 4**	**SWMC Tuirial L4(Bottom Right)**
5.	**Soil SWMCT 5**	**SWMC Tuirial L5(Bottom Left)**

Methodology of Soil Monitoring

The sampling has been done in line with IS: 2720 & Methods of Soil Analysis, Part-1, 2nd edition, 1986 of American Society for Agronomy and Soil Science Society of America. The homogenized samples were analyzed for physical and chemical characteristics (physical, chemical and heavy metal concentrations). The soil samples were collected during the period of April to September, 2024.

The samples have been analyzed as per the established scientific methods for physico- chemical parameters. The heavy metals have been analyzed by using Atomic Absorption Spectro-photometer and Inductive Coupled Plasma Analyzer.

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ANNEXURE I-A

LEACHATE WATER SAMPLE:

Sampling Location: Location 1(Tuirial SWM) **Location code: SWMCT1 & SWMCT2**
Coordinates: 23◦ 44'45"N 92◦ 47'50"E
Sample Description: Leachate **Quantity of sample: 2 Litres**
Type of Sampling: Once **Date of sampling: 15th MAY 2024**
Nature of Sample: Waste water
TEST REPORT

S. No	Parameter	Standard SWM RULES 2020 Land Disposal	Discharge point (SWMCT1)	Before joining stream (SWMCT2)
1	Suspended solids, mg/l, max	**200**	135	114
2	Dissolved solids (inorganic) mg/l, max.	**2100**	980	760
3	pH value	**5.5 to 9.0**	7.8	7.4
4	Ammonical nitrogen (as N), mg/l, max.		52	48
5	Total Kjeldahl nitrogen (as N), mg/l, max.		95.3	91.4
6	Biochemical oxygen demand	**100**	65	52
7	Chemical oxygen demand, mg/l, max.		200	156
8	Arsenic (as As), mg/l, max	**0.2**	0.1	BDL
9	Mercury (as Hg), mg/l, max		0.02	BDL
10	Lead (as Pb), mg/l, max		0.5	BDL
11	Cadmium (as Cd), mg/l, max		0	BDL
12	Total Chromium (as Cr), mg/l, max.		0.14	BDL
13	Copper (as Cu), mg/l, max.		>1	BDL
14	Zinc (as Zn), mg/l, max.		0.37	BDL
15	Nickel (as Ni), mg/l, max		0.15	BDL
16	Cyanide (as CN), mg/l, max.	**0.2**	BDL	BDL
17	Chloride (as Cl), mg/l, max.	**600**	400	320
18	Fluoride (as F), mg/l, max		0.37	BDL
19	Phenolic compounds (as C6H5OH) mg/l, max.		0.71	BDL

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ANNEXURE I-B

SURFACE WATER SAMPLE:

Sampling Location: Location 2 (Tuirial River) **Location Code: SWMCT3**

Coordinates: 23◦ 43'04" 92◦ 47'58"E

Sample Description: Surface water Quality **Quantity of sample: 2 Litres**

Type of Sampling: Once **Date of sampling: 15th MAY 2024**

Nature of Sample: Water Quality

TEST REPORT

Parameters	Methodology	num detection	Units	Standard	Recommende	Ground water
Colour			Hazen	5 to 15	IS 10501	Cloudy
Odour				Agreeable	IS 10502	Odourless
Temp	APHA: 2550 B (23rd Edition), Standard Thermometer	0.5 Deg.C	◦C	<40	ISI	23
pH	APHA: 4500-H+ B (23rd Edition), Electrometric method	1		6.5-8.5	ICMR / BIS	6.2
Turbidity	APHA 2130 B (23rd Edition), Nephelometric Method	0.1 NTU	NTU	10	IS 10500	10
Electrical C	APHA: 2510 B (23rd Edition), Conductivity meter	1 µmho/cm	µS	300	ICMR	19
Total Disso	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	100	WHO	14
Total Suspe	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	75	ICMR / BIS	9
Alkalinity	APHA: 2320 (23rd Edition) Titration method	5 mg/l	Mg/L	600	CPCB	31
Hardness	APHA: 2340-C (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	300	CPCB	23.2
Calcium	APHA: 3500-Ca-B (23rd Edition), EDTA Titrimetric Metho	2 mg/l	Mg/L	75	BIS	13.1
Magnesium	APHA: 3500 -Mg-B (23rd Edition) By Calculation	2 mg/l	Mg/L	30	BIS	10.1
Free Carbon	APHA: 2320 (23rd Edition) Titration method	2mg/l	Mg/L			11
Sulphate	PHA: 4500-E as SO4 2- (23rd Edition), Turbidimetric Metho	1 mg/l	ppm	200	CPCB	24
Phosphate	APHA: 4500 P-C (23rd Edition), Colorimetric Method	1 mg/l	ppm	5	ICMR	0.025
Nitrate-N	IS:3025 (part 34): 1988 (RA 2014) 3,3 colorimetric method	0.2 mg/l	ppm	150	ICMR	0.019
Ammonia-N	S:3025 (part-34), 1988 (RA 2014), Distillation & colorimetr	0.1 mg/l	ppm	50	CPCB	0.287
Chloride	APHA:4500 Cl- B (23rd Edition), Argentometric Method	1.0 mg/l	Mg/L	45	ICMR / BIS	10.5
Dissolve Ox	APHA: 4500 O-C (23rd edition), Iodometric method	0.2 mg/l	Mg/L	4.0-6.0	WHO	8.4
Biological C	IS:3025 (part 44): 1993 (RA 2014) Iodometric	4 mg/l	Mg/L	<2	CPCB	0.7
Chemical O	APHA : 5220 B (23rd Edition), Open Reflux Method	2mg/l	Mg/L	10	WHO	BDL

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ANNEXURE I-C

SURFACE WATER SAMPLE:

Sampling Location: Location 3 (Luite near landfill site) **Location code: SWMCT4**

Coordinates: 23◦ 45'30"N 92◦ 48'01"E

Sample Description: Surface water Quality **Quantity of sample: 2 Litres**

Type of Sampling: Once **Date of sampling: 15th MAY 2024**

Nature of Sample: Water Quality

TEST REPORT

Parameters	Methodology	Minimum detection limit	Units	Standard	Recommended	Result
Colour			Hazen	5 to 15	IS 10501	Cloudy
Odour				Agreeable	IS 10502	Odourless
Temp	APHA: 2550 B (23rd Edition), Standard Thermometer	0.5 Deg.C	◦C	<40	ISI	15
pH	APHA: 4500-H+ B (23rd Edition), Electrometric method	1		6.5-8.5	ICMR / BIS	6.4
Turbidity	APHA 2130 B (23rd Edition), Nephelometric Method	0.1 NTU	NTU	10	IS 10500	7
Electrical Conductivity	APHA: 2510 B (23rd Edition), Conductivity meter	1 µmho/cm	µS	300	ICMR	24
Total Dissolve Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	100	WHO	47
Total Suspended Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	75	ICMR / BIS	34
Alkalinity	APHA: 2320 (23rd Edition) Titration method	5 mg/l	Mg/L	600	CPCB	29
Hardness	APHA: 2340-C (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	300	CPCB	21.6
Calcium	APHA: 3500-Ca-B (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	75	BIS	13.8
Magnesium	APHA: 3500 -Mg-B (23rd Edition) By Calculation	2 mg/l	Mg/L	30	BIS	7.8
Free Carbon dioxide	APHA: 2320 (23rd Edition) Titration method	2mg/l	Mg/L			9
Sulphate	APHA: 4500-E as SO4 2- (23rd Edition), Turbidimetric Method	1 mg/l	ppm	200	CPCB	3.34
Phosphate	APHA: 4500 P-C (23rd Edition), Colorimetric Method	1 mg/l	ppm	5	ICMR	0.062
Nitrate-N	IS:3025 (part 34): 1988 (RA 2014) 3,3 colorimetric method	0.2 mg/l	ppm	150	ICMR	0.023
Ammonia-N	IS:3025 (part-34), 1988 (RA 2014), Distillation & colorimetric	0.1 mg/l	ppm	50	CPCB	0.241
Chloride	APHA:4500 Cl- B (23rd Edition), Argentometric Method	1.0 mg/l	Mg/L	45	ICMR / BIS	14.2
Dissolve Oxygen	APHA: 4500 O-C (23rd edition), Iodometric method	0.2 mg/l	Mg/L	4.0-6.0	WHO	9.7
Biological Oxygen Demand	IS:3025 (part 44): 1993 (RA 2014) Iodometric	4 mg/l	Mg/L	<2	CPCB	0.8
Chemical Oxygen Demand	APHA : 5220 B (23rd Edition), Open Reflux Method	2mg/l	Mg/L	10	WHO	BDL

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ANNEXURE I-D

SURFACE WATER SAMPLE:

Sampling Location: Location 4(Tuikhur at Tuirial village) Location code: SWMCT5

Coordinates: 23◦ 43'07"N 92◦ 47'56"E

Sample Description: Groundwater Quality **Quantity of sample: 2 Litres**

Type of Sampling: Once **Date of sampling: 15th MAY 2024**

Nature of Sample: Water Quality

TEST REPORT

Parameters	Methodology	Minimum detection limit	Units	Standard	Recommended	Result
Colour			Hazen	5 to 15	IS 10501	Clear
Odour				Agreeable	IS 10502	Odourless
Temp	APHA: 2550 B (23rd Edition), Standard Thermometer	0.5 Deg.C	◦C	<40	ISI	21
pH	APHA: 4500-H+ B (23rd Edition), Electrometric method	1		6.5-8.5	ICMR / BIS	6.2
Turbidity	APHA 2130 B (23rd Edition), Nephelometric Method	0.1 NTU	NTU	10	IS 10500	4
Electrical Conductivity	APHA: 2510 B (23rd Edition), Conductivity meter	1 µmho/cm	µS	300	ICMR	42
Total Dissolve Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	100	WHO	38
Total Suspended Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	75	ICMR / BIS	24
Alkalinity	APHA: 2320 (23rd Edition) Titration method	5 mg/l	Mg/L	600	CPCB	31
Hardness	APHA: 2340-C (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	300	CPCB	23.2
Calcium	APHA: 3500-Ca-B (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	75	BIS	13.1
Magnesium	APHA: 3500 -Mg-B (23rd Edition) By Calculation	2 mg/l	Mg/L	30	BIS	10.1
Free Carbon dioxide	APHA: 2320 (23rd Edition) Titration method	2mg/l	Mg/L			11
Sulphate	APHA: 4500-E as SO4 2- (23rd Edition), Turbidimetric Method	1 mg/l	ppm	200	CPCB	2.6
Phosphate	APHA: 4500 P-C (23rd Edition), Colorimetric Method	1 mg/l	ppm	5	ICMR	0.025
Nitrate-N	IS:3025 (part 34): 1988 (RA 2014) 3,3 colorimetric method	0.2 mg/l	ppm	150	ICMR	0.019
Ammonia-N	IS:3025 (part-34), 1988 (RA 2014), Distillation & colorimetric	0.1 mg/l	ppm	50	CPCB	0.287
Chloride	APHA:4500 Cl- B (23rd Edition), Argentometric Method	1.0 mg/l	Mg/L	45	ICMR / BIS	10.5
Dissolve Oxygen	APHA: 4500 O-C (23rd edition), Iodometric method	0.2 mg/l	Mg/L	4.0-6.0	WHO	8.4
Biological Oxygen Demand	IS:3025 (part 44): 1993 (RA 2014) Iodometric	4 mg/l	Mg/L	<2	CPCB	0.7
Chemical Oxygen Demand	APHA : 5220 B (23rd Edition), Open Reflux Method	2mg/l	Mg/L	10	WHO	BDL

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ANNEXURE I-E

SURFACE WATER SAMPLE:

Sampling Location: Location 5(Muthi River) **Location code: SWMCT6**

Coordinates: 23◦ 45'38"N 92◦ 48'28"E

Sample Description: Surface water Quality **Quantity of sample: 2 Litres**

Type of Sampling: Once **Date of sampling: 15th MAY 2024**

Nature of Sample: Water Quality

TEST REPORT

Parameters	Methodology	Minimum detection limit	Units	Standard	Recommended	Stream 1
Colour			Hazen	5 to 15	IS 10501	Cloudy
Odour				Agreeable	IS 10502	Odourless
Temp	APHA: 2550 B (23rd Edition), Standard Thermometer	0.5 Deg.C	◦C	<40	ISI	24
pH	APHA: 4500-H+ B (23rd Edition), Electrometric method	1		6.5-8.5	ICMR / BIS	6.3
Turbidity	APHA 2130 B (23rd Edition), Nephelometric Method	0.1 NTU	NTU	10	IS 10500	32
Electrical Conductivity	APHA: 2510 B (23rd Edition), Conductivity meter	1 µmho/cm	µS	300	ICMR	25
Total Dissolve Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	100	WHO	52
Total Suspended Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	75	ICMR / BIS	13
Alkalinity	APHA: 2320 (23rd Edition) Titration method	5 mg/l	Mg/L	600	CPCB	44
Hardness	APHA: 2340-C (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	300	CPCB	42
Calcium	APHA: 3500-Ca-B (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	75	BIS	8.8
Magnesium	APHA: 3500 -Mg-B (23rd Edition) By Calculation	2 mg/l	Mg/L	30	BIS	38.2
Free Carbon dioxide	APHA: 2320 (23rd Edition) Titration method	2mg/l	Mg/L			10
Sulphate	APHA: 4500-E as SO4 2- (23rd Edition), Turbidimetric Method	1 mg/l	ppm	200	CPCB	10.39
Phosphate	APHA: 4500 P-C (23rd Edition), Colorimetric Method	1 mg/l	ppm	5	ICMR	1.002
Nitrate-N	IS:3025 (part 34): 1988 (RA 2014) 3,3 colorimetric method	0.2 mg/l	ppm	150	ICMR	4.056
Ammonia-N	IS:3025 (part-34), 1988 (RA 2014), Distillation & colorimetric	0.1 mg/l	ppm	50	CPCB	4.204
Chloride	APHA:4500 Cl- B (23rd Edition), Argentometric Method	1.0 mg/l	Mg/L	45	ICMR / BIS	28.97
Dissolve Oxygen	APHA: 4500 O-C (23rd edition), Iodometric method	0.2 mg/l	Mg/L	4.0-6.0	WHO	7.3
Biological Oxygen Demand	IS:3025 (part 44): 1993 (RA 2014) Iodometric	4 mg/l	Mg/L	<2	CPCB	1.2
Chemical Oxygen Demand	APHA : 5220 B (23rd Edition), Open Reflux Method	2mg/l	Mg/L	10	WHO	BDL

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ANNEXURE I-F

GROUND WATER SAMPLE:

Sampling Location: Location 6(Borewell) **Location code: SWMCT7**

Coordinates: 23◦ 44'32"N 92◦ 47'56"E

Sample Description: Groundwater Quality **Quantity of sample: 2 Litres**

Type of Sampling: Once **Date of sampling: 15th MAY 2024**

Nature of Sample: Water Quality

TEST REPORT

Parameters	Methodology	Minimum detection limit	Units	Standard	Recommended	Ground water
Colour			Hazen	5 to 15	IS 10501	Cloudy
Odour				Agreeable	IS 10502	Odourless
Temp	APHA: 2550 B (23rd Edition), Standard Thermometer	0.5 Deg.C	°C	<40	ISI	21
pH	APHA: 4500-H+ B (23rd Edition), Electrometric method	1		6.5-8.5	ICMR / BIS	6.1
Turbidity	APHA 2130 B (23rd Edition), Nephelometric Method	0.1 NTU	NTU	10	IS 10500	10
Electrical Conductivity	APHA: 2510 B (23rd Edition), Conductivity meter	1 µmho/cm	µS	300	ICMR	47
Total Dissolve Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	100	WHO	68
Total Suspended Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	75	ICMR / BIS	24
Alkalinity	APHA: 2320 (23rd Edition) Titration method	5 mg/l	Mg/L	600	CPCB	28
Hardness	APHA: 2340-C (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	300	CPCB	58
Calcium	APHA: 3500-Ca-B (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	75	BIS	12.3
Magnesium	APHA: 3500 -Mg-B (23rd Edition) By Calculation	2 mg/l	Mg/L	30	BIS	45.7
Free Carbon dioxide	APHA: 2320 (23rd Edition) Titration method	2mg/l	Mg/L			2
Sulphate	APHA: 4500-E as SO4 2- (23rd Edition), Turbidimetric Method	1 mg/l	ppm	200	CPCB	8.68
Phosphate	APHA: 4500 P-C (23rd Edition), Colorimetric Method	1 mg/l	ppm	5	ICMR	BDL
Nitrate-N	IS:3025 (part 34): 1988 (RA 2014) 3,3 colorimetric method	0.2 mg/l	ppm	150	ICMR	1.017
Ammonia-N	IS:3025 (part-34), 1988 (RA 2014), Distillation & colorimetric	0.1 mg/l	ppm	50	CPCB	1.403
Chloride	APHA:4500 Cl- B (23rd Edition), Argentometric Method	1.0 mg/l	Mg/L	45	ICMR / BIS	28.97
Dissolve Oxygen	APHA: 4500 O-C (23rd edition), Iodometric method	0.2 mg/l	Mg/L	4.0-6.0	WHO	5
Biological Oxygen Demand	IS:3025 (part 44): 1993 (RA 2014) Iodometric	4 mg/l	Mg/L	<2	CPCB	1
Chemical Oxygen Demand	APHA : 5220 B (23rd Edition), Open Reflux Method	2mg/l	Mg/L	10	WHO	BDL

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ANNEXURE II

SOIL QUALITY:

Sampling Location: Soil SWMCT 1-5
Sample Description: Soil Quality **Quantity of sample: 300g**
Type of Sampling: Once **Date of sampling: 3rd JUNE 2024**
Nature of Sample: Soil Quality
TEST REPORT

Sl. No	Parameters	Unit	Location 1 (Top Left)	Location 2 (Center)	Location 3 (Top Right)	Location 4 (Bottom right)	Location 5 (Bottom left)
1	Colour		Brown	Brownish Yellow	Brownish Yellow	Yellowish Brown	Brownish Yellow
2	pH		5.21	6.01	5.87	6.11	6.32
3	Bulk Density	g/cm3	1.03	1.66	1.47	1.45	1.82
4	Moisture Content	%	33.9	32.7	28.2	35	29.8
5	Water Holding Capacity		1.45	1.13	1.35	1.63	1.15
6	Sand	%	64.8	80.8	77.8	45.5	86.8
7	Silt	%	12	10	10	26	5
8	Clay	%	24.2	10	12.2	28.5	8.2
9	Texture	Class	Sandy Clay Loam	Loamy Sand	Sandy Loam	Loam	Loamy Sand
10	Respiration	mg CO2 m-2 h -1	163	199	116	136	125
11	Soil organic Carbon	%	6.65	7.58	5.96	5.82	5.86
12	Total Nitrogen	mg/kg	19.49	31.89	31.43	29.76	28.65
13	Available Phosphorus	mg/kg	13.21	24.38	20.15	28.27	23.18
14	Exchangeable Potassium	mg/kg	129	399	194	263	262
15	Sodium (Excheangable)	mg/kg	31.8	98.7	14	14.6	22.6
16	Calcium (Excheangable)	mg/kg	281.87	217.94	453.1	143.19	369.63
17	Magnesium (Excheangable)	mg/kg	366.89	225.33	315.22	202.32	276.26
18	Manganese (Excheangable)	mg/kg	193.11	122.6	173.3	102.1	131.9
19	Ammonium	mg/g	5.8	5.1	5.6	4.9	4.2

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ANNEXURE III

NOISE QUALITY

Sampling Location: Noise SWMCT 1- SWMCT 6
Sample Description: Noise quality **Duration of sampling: 2 hours**
Type of Sampling: Continuous **Date of sampling: 3rd JUNE 2024**
Numbers of parameters: 1

Sl. No	Location	Equipment	Methods	Readings			Comments
1	**At Project Site 1 (0.0 / Base)SWMCT 1**	Noise meter HP-822A	IS:10988-1984 Indian standard	Leq 43	Lmin 38	Lmax 49	Within prescribe limit
2	**Site 2 (2 km in SEdirection)SWMCT 2**			43	27	49	
3	**Site 3(2 km in NW direction)SWMCT 3**			38	35	66	
4	**site 4 (2 km in W direction)SWMCT 4**			40	36	49	
5	**site 5 (2 km in E direction)SWMCT 5**			43	36	48	
6	**Site 6(2 km in N direction)SWMCT 6**			47	33	51	

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ANNEXURE IV

AIR QUALITY

Sampling Location: Air SWMCT 1- SWMCT 6
Sample Description: Noise quality **Duration of sampling: 8 hours**
Type of Sampling: Continuous **Date of sampling: 4th June 2024**
Numbers of parameters: 4

Sr. No.	Name of AAQM location (Distance in km/ Direction from Site)	Pollutant	CPCB Limit (24 hour basis unless mentioned) Concentration (µg/m3)	Test results (µg/m3)	Remarks
		PM10	100	46	Within limit
1	**At Project Site 1 (0.0 / Base) SWMCT 1**	PM2.5	60	18	Within Limit
		SO2	80	5	Within Limit
		NOX	80	7	Within limit
2	**Site 2 (2 km in SE direction SWMCT 2**	PM10	100	39	Within Limit
		PM2.5	60	15	Within Limit
		SO2	80	6	Within limit
		NOX	80	8	Within Limit
3	**Site 3(2 km in NW direction) SWMCT 3**	PM10	100	42	Within Limit
		PM2.5	60	12	Within limit
		SO2	80	4	Within Limit
		NOX	80	5	Within Limit
4	**site 4 (2 km in W direction) SWMCT 4**	PM10	100	42	Within limit
		PM2.5	60	12	Within Limit
		SO2	80	5	Within Limit
		NOX	80	6	Within limit
5	**site 5 (2 km in E direction) SWMCT 5**	PM10	100	49	Within Limit
		PM2.5	60	12	Within Limit
		SO2	80	6	Within limit
		NOX	80	8	Within Limit
6	**Site 6(2 km in N direction) SWMCT 6**	PM10	100	45	Within Limit
		PM2.5	60	12	Within limit
		SO2	80	4	Within Limit
		NOX	80	6	Within Limit

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ANNEXURE V-A

LEACHATE WATER SAMPLE:

Sampling Location: Location 1(Tuirial SWM) **Location code: SWMCT 1 & SWMCT 2**

Coordinates: 23◦ 44'45"N 92◦ 47'50"E

Sample Description: Leachate **Quantity of sample: 2 Litres**

Type of Sampling: Once **Date of sampling: 15th August 2024**

Nature of Sample: Waste water

TEST REPORT

S. No	Parameter	Standard SWM RULES 2020 Land Disposal	Discharge point SWMCT 1	Before joining stream SWMCT 2
1	Suspended solids, mg/l, max	**200**	124	112
2	Dissolved solids (inorganic) mg/l, max.	**2100**	965	750
3	pH value	**5.5 to 9.0**	7.5	7.1
4	Ammonical nitrogen (as N), mg/l, max.		51	49
5	Total Kjeldahl nitrogen (as N), mg/l, max.		95.3	90.4
6	Biochemical oxygen demand	**100**	61	54
7	Chemical oxygen demand, mg/l, max.		212	154
8	Arsenic (as As), mg/l, max	**0.2**	0.1	BDL
9	Mercury (as Hg), mg/l, max		BDL	BDL
10	Lead (as Pb), mg/l, max		0.5	BDL
11	Cadmium (as Cd), mg/l, max		0	BDL
12	Total Chromium (as Cr), mg/l, max.		0.11	BDL
13	Copper (as Cu), mg/l, max.		>1	BDL
14	Zinc (as Zn), mg/l, max.		0.33	BDL
15	Nickel (as Ni), mg/l, max		BDL	BDL
16	Cyanide (as CN), mg/l, max.	**0.2**	BDL	BDL
17	Chloride (as Cl), mg/l, max.	**600**	400	320
18	Fluoride (as F), mg/l, max		0.42	BDL
19	Phenolic compounds (as C6H5OH) mg/l, max.		0.83	BDL

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ANNEXURE V-B

SURFACE WATER SAMPLE:

Sampling Location: Location 2 (Tuirial River) **Location Code: SWMCT 3**

Coordinates: 23◦ 43'04" 92◦ 47'58"E

Sample Description: Surface water Quality **Quantity of sample: 2 Litres**

Type of Sampling: Once **Date of sampling: 18th September 2024**

Nature of Sample: Water Quality

TEST REPORT

Parameters	Methodology	Minimum detection limit	Units	Standard	Recommended	Result
Colour			Hazen	5 to 15	IS 10501	Cloudy
Odour				Agreeable	IS 10502	Odourless
Temp	APHA: 2550 B (23rd Edition), Standard Thermometer	0.5 Deg.C	◦C	<40	ISI	26
pH	APHA: 4500-H+ B (23rd Edition), Electrometric method	1		6.5-8.5	ICMR / BIS	6.1
Turbidity	APHA 2130 B (23rd Edition), Nephelometric Method	0.1 NTU	NTU	10	IS 10500	24
Electrical Conductivity	APHA: 2510 B (23rd Edition), Conductivity meter	1 µmho/cm	µS	300	ICMR	112
Total Dissolve Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	100	WHO	79
Total Suspended Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	75	ICMR / BIS	42
Alkalinity	APHA: 2320 (23rd Edition) Titration method	5 mg/l	Mg/L	600	CPCB	78
Hardness	APHA: 2340-C (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	300	CPCB	35
Calcium	APHA: 3500-Ca-B (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	75	BIS	10.1
Magnesium	APHA: 3500 -Mg-B (23rd Edition) By Calculation	2 mg/l	Mg/L	30	BIS	19.9
Free Carbon dioxide	APHA: 2320 (23rd Edition) Titration method	2mg/l	Mg/L			12
Sulphate	APHA: 4500-E as SO4 2- (23rd Edition), Turbidimetric Method	1 mg/l	ppm	200	CPCB	12.21
Phosphate	APHA: 4500 P-C (23rd Edition), Colorimetric Method	1 mg/l	ppm	5	ICMR	1.125
Nitrate-N	IS:3025 (part 34): 1988 (RA 2014) 3,3 colorimetric method	0.2 mg/l	ppm	150	ICMR	18.77
Ammonia-N	IS:3025 (part-34), 1988 (RA 2014), Distillation & colorimetric	0.1 mg/l	ppm	50	CPCB	15.322
Chloride	APHA:4500 Cl- B (23rd Edition), Argentometric Method	1.0 mg/l	Mg/L	45	ICMR / BIS	28.97
Dissolve Oxygen	APHA: 4500 O-C (23rd edition), Iodometric method	0.2 mg/l	Mg/L	4.0-6.0	WHO	6.8
Biological Oxygen Demand	IS:3025 (part 44): 1993 (RA 2014) Iodometric	4 mg/l	Mg/L	<2	CPCB	1.5
Chemical Oxygen Demand	APHA : 5220 B (23rd Edition), Open Reflux Method	2mg/l	Mg/L	10	WHO	BDL

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ANNEXURE V-C

SURFACE WATER SAMPLE:

Sampling Location: Location 3(Luite near landfill site) **Location code:SWMCT 4**

Coordinates: 23◦ 45'30"N 92◦ 48'01"E

Sample Description: Surface water Quality **Quantity of sample: 2 Litres**

Type of Sampling: Once **Date of sampling: 18th September 2024**

Nature of Sample: Water Quality

TEST REPORT

Parameters	Methodology	Minimum detection limit	Units	Standard	Recommended	Result
Colour			Hazen	5 to 15	IS 10501	Cloudy
Odour				Agreeable	IS 10502	Odourless
Temp	APHA: 2550 B (23rd Edition), Standard Thermometer	0.5 Deg.C	◦C	<40	ISI	24
pH	APHA: 4500-H+ B (23rd Edition), Electrometric method	1		6.5-8.5	ICMR / BIS	6.6
Turbidity	APHA 2130 B (23rd Edition), Nephelometric Method	0.1 NTU	NTU	10	IS 10500	38
Electrical Conductivity	APHA: 2510 B (23rd Edition), Conductivity meter	1 µmho/cm	µS	300	ICMR	115
Total Dissolve Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	100	WHO	47
Total Suspended Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	75	ICMR / BIS	29
Alkalinity	APHA: 2320 (23rd Edition) Titration method	5 mg/l	Mg/L	600	CPCB	54
Hardness	APHA: 2340-C (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	300	CPCB	35
Calcium	APHA: 3500-Ca-B (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	75	BIS	10.1
Magnesium	APHA: 3500 -Mg-B (23rd Edition) By Calculation	2 mg/l	Mg/L	30	BIS	19.9
Free Carbon dioxide	APHA: 2320 (23rd Edition) Titration method	2mg/l	Mg/L			12
Sulphate	APHA: 4500-E as SO4 2- (23rd Edition), Turbidimetric Method	1 mg/l	ppm	200	CPCB	12.39
Phosphate	APHA: 4500 P-C (23rd Edition), Colorimetric Method	1 mg/l	ppm	5	ICMR	2.65
Nitrate-N	IS:3025 (part 34): 1988 (RA 2014) 3,3 colorimetric method	0.2 mg/l	ppm	150	ICMR	17.3
Ammonia-N	IS:3025 (part-34), 1988 (RA 2014), Distillation & colorimetric	0.1 mg/l	ppm	50	CPCB	37.2
Chloride	APHA:4500 Cl- B (23rd Edition), Argentometric Method	1.0 mg/l	Mg/L	45	ICMR / BIS	22.1
Dissolve Oxygen	APHA: 4500 O-C (23rd edition), Iodometric method	0.2 mg/l	Mg/L	4.0-6.0	WHO	6
Biological Oxygen Demand	IS:3025 (part 44): 1993 (RA 2014) Iodometric	4 mg/l	Mg/L	<2	CPCB	1.8
Chemical Oxygen Demand	APHA : 5220 B (23rd Edition), Open Reflux Method	2mg/l	Mg/L	10	WHO	BDL

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XURE V-D

GROUND WATER SAMPLE:

Sampling Location: Location 4(Tuikhur at Tuirial village) Location code: SWMCT 5
Coordinates: 23◦ 43'07"N 92◦ 47'56"E
Sample Description: Groundwater Quality **Quantity of sample: 2 Litres**
Type of Sampling: Once **Date of sampling: 18th September 2024**
Nature of Sample: Water Quality

TEST REPORT

Parameters	Methodology	Minimum detection limit	Units	Standard	Recommended	Ground water
Colour			Hazen	5 to 15	IS 10501	Clear
Odour				Agreeable	IS 10502	Odourless
Temp	APHA: 2550 B (23rd Edition), Standard Thermometer	0.5 Deg.C	°C	<40	ISI	23
pH	APHA: 4500-H+ B (23rd Edition), Electrometric method	1		6.5-8.5	ICMR / BIS	6.2
Turbidity	APHA 2130 B (23rd Edition), Nephelometric Method	0.1 NTU	NTU	10	IS 10500	10
Electrical Conductivity	APHA: 2510 B (23rd Edition), Conductivity meter	1 µmho/cm	µS	300	ICMR	56
Total Dissolve Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	100	WHO	68
Total Suspended Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	75	ICMR / BIS	24
Alkalinity	APHA: 2320 (23rd Edition) Titration method	5 mg/l	Mg/L	600	CPCB	45
Hardness	APHA: 2340-C (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	300	CPCB	43
Calcium	APHA: 3500-Ca-B (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	75	BIS	12.3
Magnesium	APHA: 3500 -Mg-B (23rd Edition) By Calculation	2 mg/l	Mg/L	30	BIS	41.7
Free Carbon dioxide	APHA: 2320 (23rd Edition) Titration method	2mg/l	Mg/L			1.4
Sulphate	APHA: 4500-E as SO4 2- (23rd Edition), Turbidimetric Method	1 mg/l	ppm	200	CPCB	5.68
Phosphate	APHA: 4500 P-C (23rd Edition), Colorimetric Method	1 mg/l	ppm	5	ICMR	BDL
Nitrate-N	IS:3025 (part 34): 1988 (RA 2014) 3,3 colorimetric method	0.2 mg/l	ppm	150	ICMR	1.12
Ammonia-N	IS:3025 (part-34), 1988 (RA 2014), Distillation & colorimetric	0.1 mg/l	ppm	50	CPCB	1.31
Chloride	APHA:4500 Cl- B (23rd Edition), Argentometric Method	1.0 mg/l	Mg/L	45	ICMR / BIS	12.78
Dissolve Oxygen	APHA: 4500 O-C (23rd edition), Iodometric method	0.2 mg/l	Mg/L	4.0-6.0	WHO	5.2
Biological Oxygen Demand	IS:3025 (part 44): 1993 (RA 2014) Iodometric	4 mg/l	Mg/L	<2	CPCB	0.9
Chemical Oxygen Demand	APHA : 5220 B (23rd Edition), Open Reflux Method	2mg/l	Mg/L	10	WHO	BDL

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ANNEXURE V-E

SURFACE WATER SAMPLE:

Sampling Location: Location 5(Muthi River) **Location code: SWMCT 6**

Coordinates: 23◦ 45'38"N 92◦ 48'28"E

Sample Description: Surface water Quality **Quantity of sample: 2 Litres**

Type of Sampling: Once **Date of sampling: 18th September 2024**

Nature of Sample: Water Quality

TEST REPORT

Parameters	Methodology	Minimum detection limit	Units	Standard	Recommended	Stream 2
Colour			Hazen	5 to 15	IS 10501	Cloudy
Odour				Agreeable	IS 10502	Odourless
Temp	APHA: 2550 B (23rd Edition), Standard Thermometer	0.5 Deg.C	°C	<40	ISI	24
pH	APHA: 4500-H+ B (23rd Edition), Electrometric method	1		6.5-8.5	ICMR / BIS	6.4
Turbidity	APHA 2130 B (23rd Edition), Nephelometric Method	0.1 NTU	NTU	10	IS 10500	15
Electrical Conductivity	APHA: 2510 B (23rd Edition), Conductivity meter	1 µmho/cm	µS	300	ICMR	29
Total Dissolve Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	100	WHO	47
Total Suspended Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	75	ICMR / BIS	15
Alkalinity	APHA: 2320 (23rd Edition) Titration method	5 mg/l	Mg/L	600	CPCB	42
Hardness	APHA: 2340-C (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	300	CPCB	35
Calcium	APHA: 3500-Ca-B (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	75	BIS	10.1
Magnesium	APHA: 3500 -Mg-B (23rd Edition) By Calculation	2 mg/l	Mg/L	30	BIS	19.9
Free Carbon dioxide	APHA: 2320 (23rd Edition) Titration method	2mg/l	Mg/L			12
Sulphate	APHA: 4500-E as SO4 2- (23rd Edition), Turbidimetric Method	1 mg/l	ppm	200	CPCB	12.39
Phosphate	APHA: 4500 P-C (23rd Edition), Colorimetric Method	1 mg/l	ppm	5	ICMR	1.095
Nitrate-N	IS:3025 (part 34): 1988 (RA 2014) 3,3 colorimetric method	0.2 mg/l	ppm	150	ICMR	8.077
Ammonia-N	IS:3025 (part-34), 1988 (RA 2014), Distillation & colorimetric	0.1 mg/l	ppm	50	CPCB	5.322
Chloride	APHA:4500 Cl- B (23rd Edition), Argentometric Method	1.0 mg/l	Mg/L	45	ICMR / BIS	28.97
Dissolve Oxygen	APHA: 4500 O-C (23rd edition), Iodometric method	0.2 mg/l	Mg/L	4.0-6.0	WHO	6.8
Biological Oxygen Demand	IS:3025 (part 44): 1993 (RA 2014) Iodometric	4 mg/l	Mg/L	<2	CPCB	1.5
Chemical Oxygen Demand	APHA : 5220 B (23rd Edition), Open Reflux Method	2mg/l	Mg/L	10	WHO	BDL

Laboratory Technician

ECOMS

Zemabawk
NorthAizawl-
796017

RegNo:RF-MZ451of2020-2021

ECO-
MANAGEMENTSERVICES(ECOMSMIZO
RAM)

Pan:AAIFE6941L

ANNEXURE V-F

GROUND WATER SAMPLE:

Sampling Location: Location 6(Borewell) **Location code: SWMCT 7**

Coordinates: 23◦ 44'32"N 92◦ 47'56"E

Sample Description: Groundwater Quality **Quantity of sample: 2 Litres**

Type of Sampling: Once **Date of sampling: 18th September 2024**

Nature of Sample: Water Quality

TEST REPORT

Parameters	Methodology	Minimum detection limit	Units	Standard	Recommended	Result
Colour			Hazen	5 to 15	IS 10501	Clear
Odour				Agreeable	IS 10502	Odourless
Temp	APHA: 2550 B (23rd Edition), Standard Thermometer	0.5 Deg.C	◦C	<40	ISI	22
pH	APHA: 4500-H+ B (23rd Edition), Electrometric method	1		6.5-8.5	ICMR / BIS	5.8
Turbidity	APHA 2130 B (23rd Edition), Nephelometric Method	0.1 NTU	NTU	10	IS 10500	8
Electrical Conductivity	APHA: 2510 B (23rd Edition), Conductivity meter	1 µmho/cm	µS	300	ICMR	23
Total Dissolve Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	100	WHO	13
Total Suspended Solids	APHA: 2540 C (23rd Edition), Gravimetric	3 mg/l	Mg/L	75	ICMR / BIS	6
Alkalinity	APHA: 2320 (23rd Edition) Titration method	5 mg/l	Mg/L	600	CPCB	29
Hardness	APHA: 2340-C (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	300	CPCB	29.1
Calcium	APHA: 3500-Ca-B (23rd Edition), EDTA Titrimetric Method	2 mg/l	Mg/L	75	BIS	13.9
Magnesium	APHA: 3500 -Mg-B (23rd Edition) By Calculation	2 mg/l	Mg/L	30	BIS	15.2
Free Carbon dioxide	APHA: 2320 (23rd Edition) Titration method	2mg/l	Mg/L			10
Sulphate	APHA: 4500-E as SO4 2- (23rd Edition), Turbidimetric Method	1 mg/l	ppm	200	CPCB	3.53
Phosphate	APHA: 4500 P-C (23rd Edition), Colorimetric Method	1 mg/l	ppm	5	ICMR	0.035
Nitrate-N	IS:3025 (part 34): 1988 (RA 2014) 3,3 colorimetric method	0.2 mg/l	ppm	150	ICMR	0.027
Ammonia-N	IS:3025 (part-34), 1988 (RA 2014), Distillation & colorimetric	0.1 mg/l	ppm	50	CPCB	0.294
Chloride	APHA:4500 Cl- B (23rd Edition), Argentometric Method	1.0 mg/l	Mg/L	45	ICMR / BIS	11.3
Dissolve Oxygen	APHA: 4500 O-C (23rd edition), Iodometric method	0.2 mg/l	Mg/L	4.0-6.0	WHO	8.9
Biological Oxygen Demand	IS:3025 (part 44): 1993 (RA 2014) Iodometric	4 mg/l	Mg/L	<2	CPCB	0.5
Chemical Oxygen Demand	APHA : 5220 B (23rd Edition), Open Reflux Method	2mg/l	Mg/L	10	WHO	BDL

Laboratory Technician

ECOMS

Zemabawk
NorthAizawl-796017

RegNo:RF-MZ451of2020-2021

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ECO-MANAGEMENTSERVICES(ECOMSMIZORAM)

Pan:AAIFE6941L

Email:Ecomsmizoram.in

ANNEXURE VI

SOIL QUALITY:

Sampling Location: Tuirial SWMC
Sample Description: Soil Quality
Type of Sampling: Once
Nature of Sample: Soil Quality
TEST REPORT

Code: SWMCT 1- SWMCT 5
Quantity of sample: 300g
Date of sampling: 19th September 2024

Sl. No	Parameters	Unit	Location 1 (Top Left)	Location 2 (Center)	Location 3 (Top Right)	Location 4 (Bottom right)	Location 5 (Bottom left)
1	Colour		Brown	Brownish Yellow	Brownish Yellow	Yellowish Brown	Brownish Yellow
2	pH		5.11	5.09	5.67	5.99	6.24
3	Bulk Density	g/cm3	1.03	1.66	1.47	1.45	1.82
4	Moisture Content	%	37.9	36.9	30.2	39	39.8
5	Water Holding Capacity		1.45	1.13	1.35	1.63	1.15
6	Sand	%	64.8	80.8	77.8	45.5	86.8
7	Silt	%	12	10	10	26	5
8	Clay	%	24.2	10	12.2	28.5	8.2
9	Texture	Class	Sandy Clay Loam	Loamy Sand	Sandy Loam	Loam	Loamy Sand
10	Respiration	mg CO2 m-2 h -1	178	199	124	156	155
11	Soil organic Carbon	%	7.65	7.56	6.66	6.12	5.98
12	Total Nitrogen	mg/kg	29.49	35.79	36.23	35.76	38.65
13	Available Phosphorus	mg/kg	23.21	28.38	26.45	29.77	33.18
14	Exchangeable Potassium	mg/kg	129	399	194	263	262
15	Sodium (Excheangable)	mg/kg	31.8	98.7	14	14.6	22.6
16	Calcium (Excheangable)	mg/kg	281.87	217.94	453.1	143.19	369.63
17	Magnesium (Excheangable)	mg/kg	366.89	225.33	315.22	202.32	276.26
18	Manganese (Excheangable)	mg/kg	193.11	122.6	173.3	102.1	131.9
19	Ammonium	mg/g	6.7	5.8	6.2	5.1	5.4

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ANNEXURE VII

NOISE QUALITY

Sampling Location: Tuirial SWMC
Sample Description: Noise quality
Type of Sampling: Continuous
Numbers of parameters: 1

Code: SWMCT 1- SWMCT 6
Duration of sampling: 2 hours
Date of sampling: 20th September 2024

Sl. No	Location	Equipment	Methods	Readings			Comments
1	**At Project Site 1 (0.0 / Base) SWMCT 1**	Noise meter HP-822A	IS:10988-1984 Indian standard	Leq 46	Lmin 38	Lmax 51	Within prescribe limit
2	**Site 2 (2 km in SEdirection)SWMCT 2**			45	32	48	
3	**Site 3(2 km in NW direction)SWMCT 3**			36	31	51	
4	**site 4 (2 km in W direction)SWMCT 4**			40	36	49	
5	**site 5 (2 km in E direction)SWMCT 5**			45	37	53	
6	**Site 6(2 km in N direction)SWMCT 6**			45	31	54	

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ANNEXURE VIII

AIR QUALITY

Sampling Location: Tuirial SWMC **Code: SWMCT 1-SWMCT 6**
Sample Description: Noise quality **Duration of sampling: 8 hours**
Type of Sampling: Continuous **Date of sampling: 20th September 2024**
Numbers of parameters: 4

Sr. No.	Name of AAQM location (Distance in km/ Direction from Site)	Pollutant	CPCB Limit (24 hour basis unless mentioned) Concentration (µg/m3)	Test results (µg/m3)	Remarks
		PM10	100	41	Within limit
1	**At Project Site 1 (0.0 / Base)**	PM2.5	60	12	Within Limit
		SO2	80	5	Within Limit
	SWMCT 1	NOX	80	7	Within limit
2	**Site 2 (2 km in SE direction**	PM10	100	40	Within Limit
		PM2.5	60	13	Within Limit
		SO2	80	6	Within limit
	SWMCT 2	NOX	80	8	Within Limit
3	**Site 3(2 km in NW direction)**	PM10	100	44	Within Limit
		PM2.5	60	10	Within limit
		SO2	80	4	Within Limit
	SWMCT 3	NOX	80	5	Within Limit
4	**site 4 (2 km in W direction)**	PM10	100	39	Within limit
		PM2.5	60	8	Within Limit
		SO2	80	5	Within Limit
	SWMCT 4	NOX	80	6	Within limit
5	**site 5 (2 km in E direction)**	PM10	100	41	Within Limit
		PM2.5	60	10	Within Limit
		SO2	80	6	Within limit
	SWMCT 5	NOX	80	8	Within Limit
6	**Site 6(2 km in N direction)**	PM10	100	38	Within Limit
		PM2.5	60	8	Within limit
		SO2	80	4	Within Limit
	SWMCT 6	NOX	80	6	Within Limit

ANNEXURE IX

Environmental Cell:

AIZAWL MUNICIPAL CORPORATION
Thuampui, Aizawl - 796017 : Mizoram
Ph: 0389-2352090 Email: amcmizoram@gmail.com Website: www.amcmizoram.com

Azadi ka Amrit Mahotsav

Dated Aizawl, the 13th June, 2023

NOTIFICATION

Pursuant to operationalization of Solid Waste Management Centre (SWMC) at Tuirial and as per Ministry of Environment, Forest and Climate Change with regard to Environmental Clearance for the development of landfill site of SWMC at Tuirial Vide No. RONE/E/IA/INF/27/2005-07, dated 14th October, 2022, **Environmental Cell** is hereby constituted with the following composition with immediate effect and until further order.

1. Pu Lalremruata Kullai, Joint Municipal Commissioner, AMC - Chairman
2. Pu R Lalmuanpuia, Executive Engineer, AMC - Secretary
3. Prof. Lalnuntluanga, Deptt of Environmental Science, MZU - Member
4. Pu C.Lalmuanawma, Town Planner, AMC - Member
5. Pi Helen Rodingliani, Executive Engineer, PHE -Member
6. Pi Vanlalnunpuii Hmar, Divisional Forest Officer, EF & CC Deptt. - Member
7. Pi PC Lalmuanpuii, Environmental Engineer, MPCB - Member
8. Pi Veronica Vanlalhriatpuii Colney, Assistant Architect, AMC - Member

Terms & Conditions:

1. The Environmental Cell shall prepare effective and efficient proposals relating/pertaining to the maintenance and operation of SWMC at Tuirial.
2. The Environmental Cell shall study and prepare report in all matters relating to the status of SWMC Reports, etc i.e. Six Monthly Report to be submitted to Integrated Regional Office (IRO) at Shillong.
3. The tenure of Environmental Cell will be valid during utilization of SWMC at Tuirial.
4. The meeting of the Cell will be convened at least once a month or as may be required and decided by AMC.
5. Representatives of Departments, other than representatives of AMC, shall be given Rs. 1500/- per head as meeting allowance per meeting.

(Er. LALHRIATPUIA)
Municipal Commissioner
Aizawl Municipal Corporation

Memo No. D.24015/314/2021-AMC : Dated Aizawl the 13th June, 2023

Copy to:

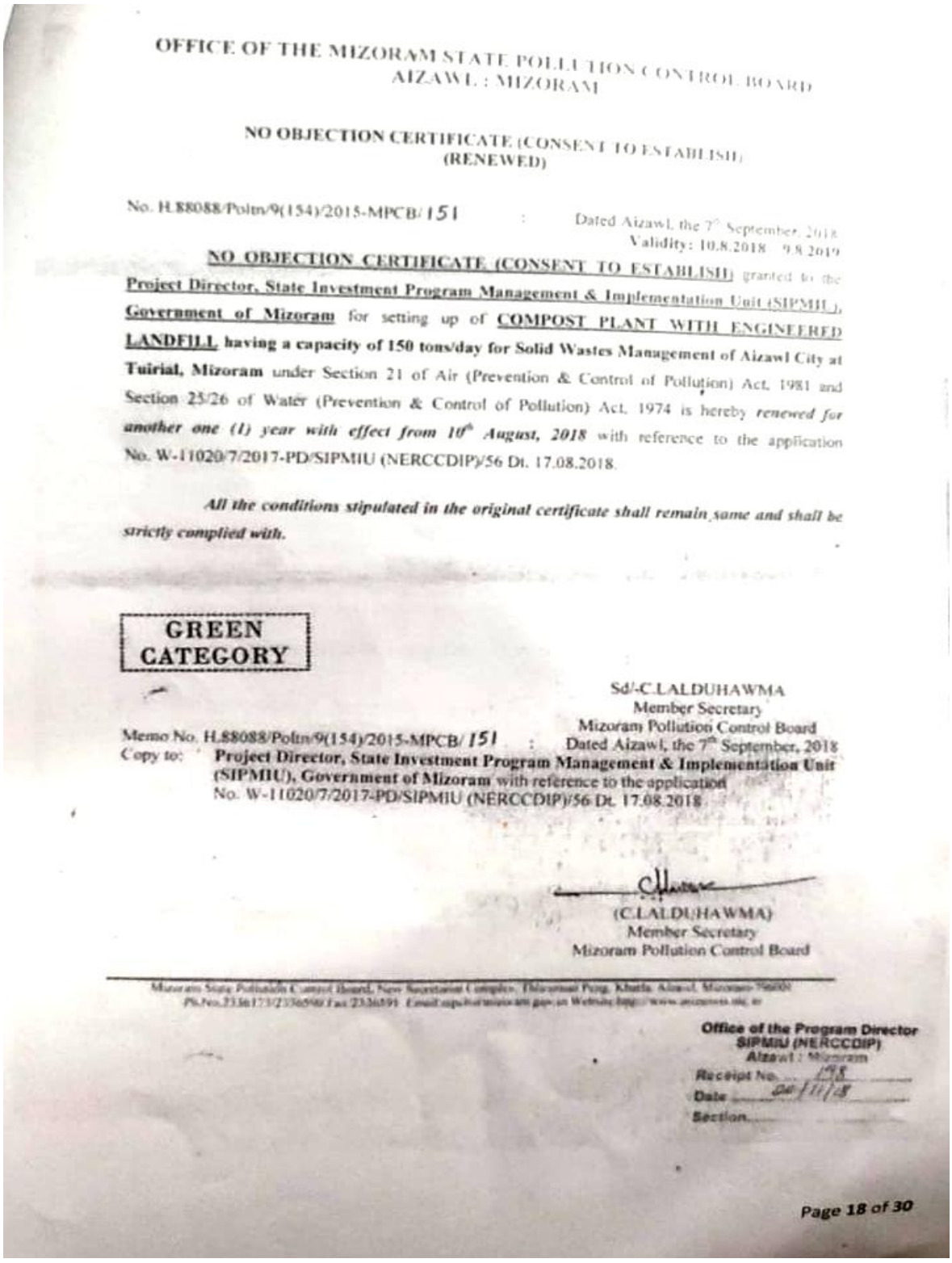
1. PA to Mayor, AMC, for information.
2. PA to Executive Councillors i/c SWMC, AMC, for information.
3. The Principal Secretary, EF & CC Deptt., for information.
4. The Engineer-in-Chief, PHED, for information.
5. The Registrar, MZU, for information.
6. The Member Secretary, MPCB, for information.
7. All Members concerned, for information.
8. All Officers under AMC, for information.
9. Guard file.

Municipal Commissioner
Aizawl Municipal Corporation

TO AVOID COVID-19 INFECTION WEAR MASK, OBSERVE PHYSICAL DISTANCING OF 6 FEET, MAINTAIN HAND HYGIENE.

ANNEXURE X

Consent to Establish:



OFFICE OF THE MIZORAM STATE POLLUTION CONTROL BOARD
AIZAWL : MIZORAM

NO OBJECTION CERTIFICATE (CONSENT TO ESTABLISH)
(RENEWED)

No. H.88088/Poltn/9(154)/2015-MPCB/151 : Dated Aizawl, the 7th September, 2018
Validity: 10.8.2018 - 9.8.2019

NO OBJECTION CERTIFICATE (CONSENT TO ESTABLISH) granted to the **Project Director, State Investment Program Management & Implementation Unit (SIPMIU), Government of Mizoram** for setting up of **COMPOST PLANT WITH ENGINEERED LANDFILL having a capacity of 150 tons/day for Solid Wastes Management of Aizawl City at Tuirial, Mizoram** under Section 21 of Air (Prevention & Control of Pollution) Act, 1981 and Section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 is hereby *renewed for another one (1) year with effect from 10th August, 2018* with reference to the application No. W-11020/7/2017-PD/SIPMIU (NERCCDIP)/56 Dt. 17.08.2018.

All the conditions stipulated in the original certificate shall remain same and shall be strictly complied with.

GREEN CATEGORY

Sd/-C.LALDUHAWMA
Member Secretary
Mizoram Pollution Control Board

Memo No. H.88088/Poltn/9(154)/2015-MPCB/151 : Dated Aizawl, the 7th September, 2018
Copy to: **Project Director, State Investment Program Management & Implementation Unit (SIPMIU), Government of Mizoram** with reference to the application No. W-11020/7/2017-PD/SIPMIU (NERCCDIP)/56 Dt. 17.08.2018.

(C.LALDUHAWMA)
Member Secretary
Mizoram Pollution Control Board

Mizoram State Pollution Control Board, New Secretariat Complex, Treasury Peng, Khatla, Aizawl, Mizoram-796001
Ph.No.2336173/2336590 Fax 2336591 Email:mpcb@mizoram.gov.in Website:http://www.mpcb.mp.in

Office of the Program Director
SIPMIU (NERCCDIP)
Aizawl : Mizoram
Receipt No. 1498
Date 10/11/18
Section

Page 18 of 30

ANNEXURE XI

Green Belt:

Green belt reserved is well maintain to reduce the adverse effect of the SWM on the environment. Quadrats Random sampling methods was employed to evaluate the diversity of different tree species in the green belt area. 39 tree species were record, most of the trees grows naturally in the area while few are planted.

Tree Species and Diversity

Sl.No	Local Name	Scientific Name	Number of Individual (Q)	Number of Quadrats (Y)	Occurrence (X)	Relative Dominance	Relative Frequency	IVI	Rank
1	April	*Erythrina caffra*	3	10	3	2.12	4.29	7.25	12
2	Ar-dah	*Archidendron bigeminum*	5	10	4	1.18	5.71	8.31	9
3	Ar-ngeng	*Maesa indica*	1	10	1	0.38	1.43	2.09	32
4	Chhawn-tual	*Aporosa octandra*	4	10	1	1.53	1.43	4.09	25
5	Herh-se	*Messua ferrea*	6	10	2	0.12	2.86	4.67	23
6	Hmawng	*Ficus maclellandii*	1	10	1	0.11	1.43	1.82	35
7	Hnah-khar	*Macaranga indica*	7	10	1	0.21	1.43	3.62	28
8	Hnahkhar-pa	*Macaranga denticualata*	8	10	6	0.21	8.57	11.05	3
9	Hnah-kiah	*Callicarp arborea Roxb.*	6	10	2	0.22	2.86	4.78	20
10	Kang-tek	*Albizia procera*	7	10	3	0.51	4.29	6.78	16
11	Khar-duap	*Macaranga peltata*	8	10	6	0.26	8.57	11.10	2
12	Khar pa	*Mallotus macrostachyus*	1	10	1	0.03	1.43	1.74	37
13	Khiang	*Schima wallichi*	8	10	4	0.37	5.71	8.35	8
14	Khuang-thli	*Bischofia javanica*	1	10	1	0.03	1.43	1.74	36
15	Lam-khuang	*Artocarpus heterophyllus*	5	10	6	0.15	8.57	10.14	6
16	Len-hmui	*Syzygium cumini*	6	10	2	0.21	2.86	4.76	21
17	Nau-thak	*Litsea manopetala*	5	10	4	0.22	5.71	7.35	10
18	Neempata	*Azadirachta indica*	5	10	4	0.12	5.71	7.25	13
19	Ngiau	*Michelia champaca*	7	10	6	0.37	8.57	10.92	4
20	Pathlawi-rim-nam	*N/A*	6	10	2	0.16	2.86	4.72	22
21	Sazu-thei-pui	*Ficus hirta*	2	10	2	0.03	2.86	3.45	31
22	Se-hawr	*Castanopsis indica*	7	10	6	0.20	8.57	10.75	5
23	Si-hneh	*Eurya cerasifolia*	7	10	7	0.10	10.00	12.08	1
24	Sun-hlu	*Phyllanthus emblica*	3	10	2	0.08	2.86	3.79	27
25	Teak	*Tectona grandis*	6	10	3	0.22	4.29	6.20	17
26	Thei-hai	*Mangifera indica*	6	10	2	0.23	2.86	4.79	19
27	Thei-pui	*Ficus semicordata*	2	10	2	0.10	2.86	3.52	29
28	Thei-tat	*Artocarpus lakoocha*	1	10	1	0.11	1.43	1.82	34
29	Thel-ret	*Ficus elastica*	1	10	1	0.03	1.43	1.74	38
30	Thing-dawl	*Tetrameiss nudiflora*	4	10	2	0.41	2.86	4.40	24
31	Thing-khawi-lu	*Vitex peduncularis*	2	10	6	0.09	8.57	9.23	7
32	Thing-pawn-chhia	*Glochidion heyneanum*	2	10	1	0.05	1.43	2.04	33
33	Thing-sia	*Castanopsis tribuloides*	8	10	3	0.31	4.29	6.86	15
34	Thlan-vawng	*Gmelina arborea*	3	10	2	0.13	2.86	3.84	26
35	Thuam-riat	*Alstonia scholaris*	2	10	2	0.07	2.86	3.49	30
36	Vang	*Albizia chinensis*	5	10	3	0.32	4.29	6.02	18
37	Vawm-bal	*Drimycarpus racemosus*	1	10	1	0.02	1.43	1.73	39
38	Zai-rum	*Anogeissus acuminate*	4	10	4	0.22	5.71	7.07	14
39	Zawng-tah	*Parkia timoriana*	5	10	4	0.16	5.71	7.28	11

Laboratory Technician
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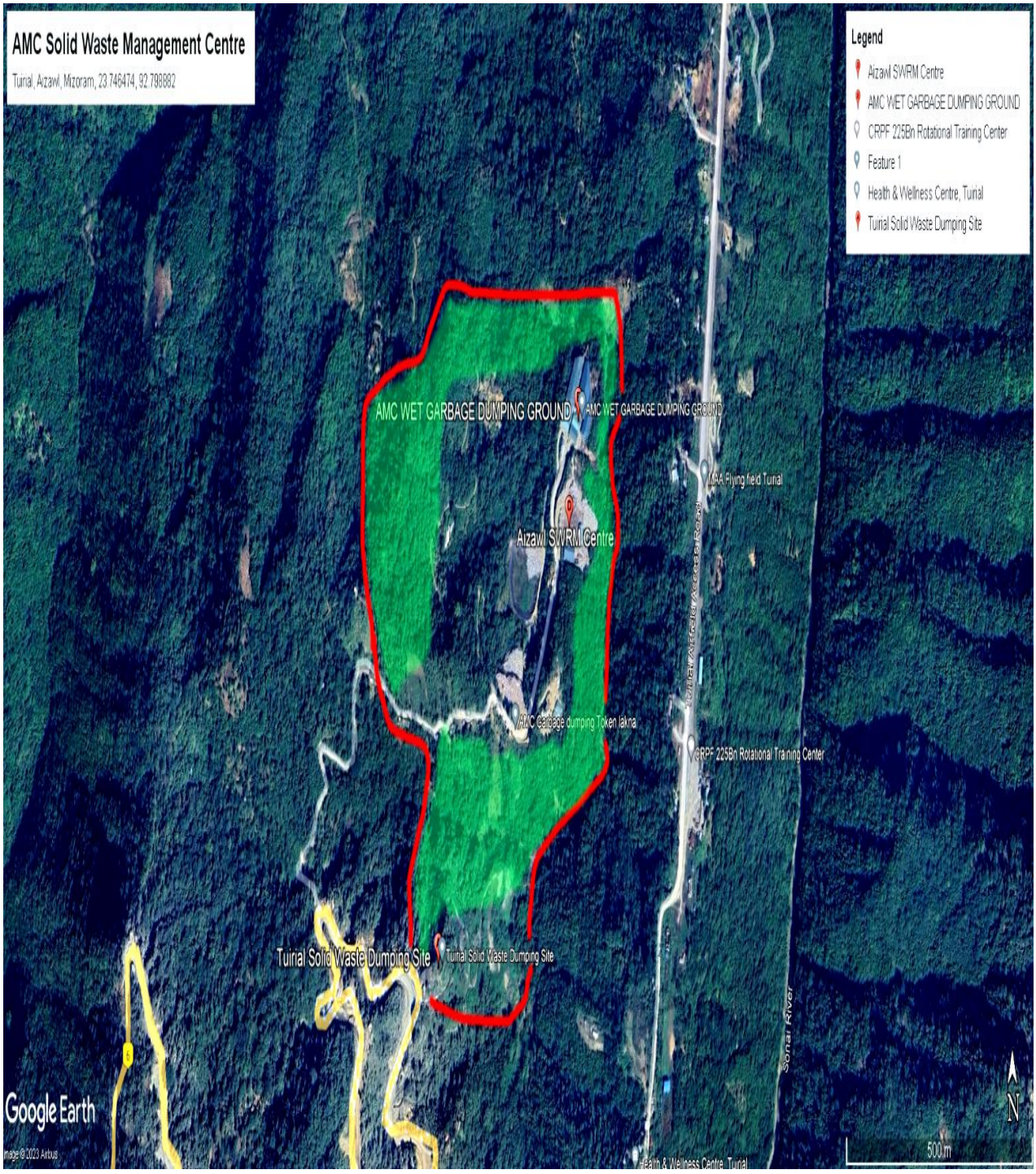

Map showing green belt area of TUIRIAL SWM

ANNEXURE XII

Photo Plates: